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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,320	09/16/2005	Yasushi Sato	0670-7061	8212

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EXAMINER	
LERNER, MARTIN	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,320	SATO ET AL.	
	Examiner	Art Unit	
	Martin Lerner	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3 to 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3 to 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshizumi et al.* in view of *Chen et al.*

Concerning independent claim 1, *Yoshizumi et al.* discloses an apparatus for processing speech, comprising:

"a pitch component extraction means which acquires a speech signal representing the waveform of a speech to extract a pitch component of the speech from the speech signal" – pitch detector 23 detects the pitch of the speech signal (column 8, lines 15 to 26: Figure 3);

"delay means for delaying the speech signal" – second delay circuit 21 delays the input speech signal (column 8, lines 15 to 26: Figure 3); first delay circuit 12 delays the speech signal for a time b required for processing of the speech signal (column 5, lines 3 to 15: Figure 1);

"gain determination means which determines the gain of the speech signal based on the intensity of the extracted pitch component to amplify or attenuate the speech signal by use of the determined gain" – coefficient calculating circuit 11 generates a

compensation coefficient A(t) on the basis of the speech signal at time t; coefficient control circuit 14 receives the compensation coefficient A(t) from coefficient calculating circuit 11 and generates a new compensation coefficient G(t), which defines the length of a time period during which the input speech signal is amplified and the gain with which the input speech signal is amplified; multiplier 13 multiplies ("to amplify or attenuate") the speech signal S(t) by the compensation coefficient G(t) (column 5, lines 16 to 47: Figure 1); additionally, a duration of the compensation coefficient is determined from an output signal of judgement circuit 24; an output from pitch detector 23 is sent to judgement circuit 24, and judgement circuit 24 determines a feature value, *e.g.* whether there exists a vowel after a consonant in the speech signal, or a plosive; this makes it possible to control the duration of the compensation coefficient depending on the kinds of consonants used such as plosives and fricatives (column 8, line 29 to column 9, line 12: Figure 3); thus, the compensation coefficient G(t), or gain, is based on "the intensity of the extracted pitch component";

"wherein said delay means delays the speech by a delay corresponding to the possible maximum time length taken up by a consonant immediately before a vowel" – first delay circuit 12 delays the speech signal for a time b required for processing of the speech signal (column 5, lines 3 to 15: Figure 1); an objective is to change the amplitude, or gain, of plosives before vowels (column 7, line 62 to column 8, line 16: Figures 2A to 2D; Figure 6A; column 11, line 59 to column 12, line 2: Figures 18A to 18D); absolute value delay circuit 122 stores output at a time t and the time before and after it (|S(t + b)| to |S(t—f)|) (column 5, line 51 to column 6, line 24: Figure 11; Figures

12 to 15); thus, the value of the delay, b, is at least long enough to process a plosive, which is a consonant before a vowel.

Concerning independent claim 1, *Yoshizumi et al.* discloses extracting a pitch component, and identifying a fundamental frequency of the speech, which is the pitch, but omits "a variable filter which varies the pass band thereof according to a control and filters the speech signal to thereby extract components within the pass band; and a filter characteristic determination section which, to cause the variable filter to extract the pitch component, identifies the fundamental frequency of the speech based on the speech signal and controls the variable filter so that the filter has a pass band in which components other than the identified fundamental frequency and vicinity thereof are cut off." However, it is known in speech processing to filter speech around frequencies where a pitch, or fundamental frequency, is found for a purpose of detecting voice components and distinguishing speech from background noise. *Chen et al.* teaches an adaptable filter 110, which is used for filtering out the signals other than a fundamental frequency of a periodic voiced speech signal, *e.g.* a vowel. Spectrum points near the fundamental frequency point are retained, and fundamental passband frequency signals are found. (Column 3, Lines 14 to 30: Figure 1) An objective is to obtain an improved method of pitch mark determination, preventing a condition where a conventional bandpass filter is constrained in a fixed passband, in which harmonic frequency signals and a fundamental frequency signal are both retained. (Column 2, Lines 23 to 40) It would have been obvious to one having ordinary skill in the art to provide a variable filter which varies a pass band to extract a pitch component, and identify a fundamental

frequency, so that components other than an identified fundamental frequency are cut off as taught by *Chen et al.* in an apparatus for processing speech based upon consonant features of *Yoshizumi et al.* for a purpose of eliminating harmonic components in a method of pitch mark determination.

Concerning claim 3, *Yoshizumi et al.* omits a filter characteristic determination section that includes a cepstrum analysis section that identifies as the fundamental frequency of the speech, a frequency at which the cepstrum of the speech signal has a maximum value. However, cepstra are well known parameters in speech recognition, and are known to provide a method for determination of pitch of a speech signal, as the largest peaks in the cepstral domain represent the fundamental frequency or pitch component. Specifically, *Chen et al.* teaches that there are many methods for acquiring the pitch of a speech signal, and that U.S. Patent No. 5,630,015 teaches a method of acquiring a pitch by performing cepstral analysis to obtain a peak of the obtained cepstrum, as an art recognized alternative to a standard autocorrelation method. (Column 1, Lines 54 to 66) It would have been obvious to one having ordinary skill in the art to acquire a fundamental frequency from a speech signal by cepstrum analysis from a maximum value of a cepstrum as taught by *Chen et al.* in an apparatus for processing speech based upon consonant features of *Yoshizumi et al.* as an art recognized alternative method of pitch determination.

Concerning claim 4, *Chen et al.* teaches that, after the adaptable filter 110 finds the fundamental frequency point, only the spectrum points around the fundamental

frequency are retained, and the remaining spectrum points are cleared to zero ("a cross detection section which filters a speech signal to eliminate a band in which the fundamental frequency component is not substantially contained"). (Column 3, Lines 14 to 30: Figure 1: Steps 102 and 103) Then, a set of pitch marks is generated at zero passing positions of the fundamental frequency passband signals by pitch-mark detector 112 ("identifies a timing at which non-eliminated components reach a predetermined value, and identifies the fundamental frequency based on the identified timing"). (Column 3, Lines 31 to 48: Figure 1: Steps 106 to 108)

Concerning claim 6, *Yoshizumi et al.* discloses that coefficient calculating circuit 11 generates a compensation coefficient A(t) on the basis of the speech signal at time t and also just before and after the time t ("wherein the gain determination means determines . . . the gain of the speech signal in the time period and a predetermined time period preceding the time period") (column 5, lines 7 to 12: Figure 1); a speech processing apparatus can control the compensation coefficient for providing the appropriate length of time period during which the input speech is to be amplified, depending on the kinds of consonants (column 8, line 58 to column 9, line 3); judgement circuit 24 outputs a signal indicating the kind of plosives in the input speech signal based on the output from pitch detector 23 (column 8, lines 41 to 57: Figure 3); thus, the duration of the compensation coefficient, or gain, depends upon the detection of the pitch ("based on the intensity of the extracted pitch component within one time period").

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshizumi et al.* in view of *Chen et al.* as applied to claims 1 and 4 above, and further in view of *Nott*.

Concerning claim 5, *Chen et al.* teaches accurately determining pitch from a timing of pitch marks, but does not determine, based on the identified timing, whether or not the speech contains the fundamental frequency component of a certain amount or more, and if not, the cross detection section notifies the variable filter that the pitch component is not contained, and the variable filter cuts off the speech signal in response to the notification that the pitch component is not contained.

Concerning claim 5, however, *Nott* teaches a squelch circuit, where a zero-crossing rate of an audio signal is measured to determine whether the signal contains speech or not. Specifically, a dominant spectral component, or pitch, lies in the range of about 100 Hz to 300 Hz for male voices and from about 200 Hz to 700 Hz for female voices. With noise, however, the frequency of the dominant spectral components covers a much wider range. (Column 1, Line 66 to Column 2, Line 7) A limiting amplifier removes all information that is not near the center of the waveform, so that the resultant spectrum has a dominant spectra enhanced, thus providing a low (100 to 700 Hz) average zero-crossing rate for speech and a higher (800 to 3000 Hz) average zero-crossing rate for noise. (Column 2, Lines 24 to 31) Then, the amplifier is unmuted when the average zero-crossing ("based on the identified timing") suddenly reduces, corresponding to the appearance of speech ("whether or not the speech contains the

fundamental frequency component of a certain amount or more"), and if the zero-crossing rate later increases, the receiver is muted ("the variable filter cuts off the speech signal in response to the notification that the pitch component is not contained") when it has risen above a specific threshold. (Column 2, Lines 51 to 63) The objective is to mute a processing of an audio signal when there is no intelligence being received. (Column 1, Lines 1 to 11) It would have been obvious to one having ordinary skill in the art to apply a method of cutting off a speech signal when no fundamental frequency is present as indicated by zero-crossings as taught by *Nott* in method of determining a fundamental frequency by pitch marks of *Chen et al.* for a purpose of muting an audio signal when no speech is present.

Response to Arguments

4. Applicants' arguments filed 23 July 2007 have been considered but are moot in view of the new grounds of rejection, necessitated by amendment.

Conclusion

5. Applicants' amendment necessitated the new grounds of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (571) 272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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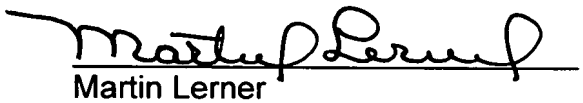

Martin Lerner
Examiner
Group Art Unit 2626